A REVIEW OF THE IGUANID LIZARD GENERA *URACENTRON* AND *STROBILURUS*

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SYNOPSIS

The external morphology, distribution, and systematics of the iguanid lizard genera *Uracentron* and *Strobilurus* are reviewed. Four species of *Uracentron* and one species of *Strobilurus* are recognized, and a key is given to the species of *Uracentron*. Two species erroneously referred to *Uracentron* are discussed.

INTRODUCTION

Uracentron and *Strobilurus* are South American iguanid lizards belonging to a group of genera that I have called the " tropidurines ", (Etheridge, 1964 : 629). Within this group *Uracentron* is easily identified by its very large interparietal scale, and short, spiny tail, and by the absence of a row of scales aligned mid-dorsally. *Strobilurus* is closely allied to it, and like *Uracentron* has a very large interparietal scale and a spiny tail ; it differs in having a row of scales aligned middorsally. Also, the tail of *Uracentron* is flat, nonautotomic, and scarcely more than half as long as the head and body, whereas the tail of *Strobilurus* is nearly cylindrical, autotomic, and about as long as the head and body.

Of the species we now know under the genus *Uracentron* the first was described as *Lacerta azurea* by Linnaeus (1758 : 202). Prior to this the species had been figured by Seba (1734 : 2 : 62 : 6), and Linnaeus (1754 : 42) had described in some detail specimens then in the Museum of King Adolf Fredrik of Sweden. *Lacerta azurea* was subsequently combined with diverse other lizards that also have a spiny tail under the genera *Stellio* (Latreille, 1802 : 29 and 34 ; Daudin, 1802 : 36 and 40 ; Fitzinger, 1826 : 49), and *Uromastyx* (Merrem, 1820 : 56–7). The generic name *Uracentron* was introduced by Kaup (1826 : 88), and in the following year he included *Uracentron* in his list of the New World lizards (Kaup, 1827 : 612). The latter publication was cited as the original description of the genus by Burt & Burt (1933 : 48). Wagler (1830 : 145) changed the spelling to *Urocentron*, and with few exceptions (Mertens, 1925 : 75 ; Dunn, 1944 : 89 ; Valdivieso & Tamsitt, 1963 : 31 ; Peters, 1967 : 36) all later authors either adopted the change, or altered it still again to *Uranocentron* (Gray, 1831 : 42, 1845 : 225; O'Shaughnessy, 1881 : 245), or to *Urocentrum* (Boulenger, 1894 : 729; Werner, 1900 : 4). Cuvier (1829 : 34) proposed *Doryphorus* as a substitute name, and for a time it was also in use (Schinz, 1835 : 92 ; Guérin-Méneville, 1829–1838 : 8 ; Duméril & Bibron, 1837 : 369 ; Guichenot, 1855 : 26 ; Duméril, 1856 : 559 ; Cope, 1870 : 556).

Boulenger (1885 : 182–184) recognized three species of *Uracentron : azureum* (Linnaeus, 1758), *flaviceps* (Guichenot, 1855), and *castor* (Cope, 1870), and later he described a fourth species, *U. guentheri* (Boulenger, 1894 : 729). A fifth species was described by Mertens (1925 : 75), *U. werneri*. Burt & Burt (1933 : 48–9) recognized five species of *Uracentron* in their Checklist of South American Lizards. They included *U. meyeri* (Werner, 1900 : 4), and *U. palluma* (Tschudi, 1845 : 35),

neither of which is correctly referred to the genus *Uracentron*, and they failed to include *U. flaviceps* and *U. werneri*.

In the present study *U. meyeri* and *U. palluma* are removed from the genus *Uracentron*, *U. castor* is placed in the synonomy of *U. flaviceps*, and this species together with *U. azureum*, *U. guentheri*, and *U. werneri* are considered valid species.

Strobilurus is, and has always been, considered monotypic, with the single species *S. torquatus* (Wiegmann, 1834 : 18).

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The following abbreviations are used :

A.M.N.H.	American Museum of Natural History, New York.
A.N.S.P.	Academy of Natural Sciences of Philadelphia.
B.M.N.H.	British Museum (Natural History), London.
C.A.S.	California Academy of Sciences, San Francisco.
F.M.N.H.	Field Museum of Natural History, Chicago.
L.A.C.M.	Los Angeles County Museum, Los Angeles.
M.C.Z.	Museum of Comparative Zoology, Harvard University, Cambridge.
M.H.N.P.	Muséum National d'Histoire Naturelle, Paris.
N.M.W.	Naturhistorischen Museum, Wien (Vienna).
N.R.M.S.	Naturhistoriska Riksmuseet, Stockholm.
S.M.F.	Natur-Museum und Forschungs-Institut Senckenberg, Frankfurt.

S.M.N.L. Staatliches Museum für Naturkunde, Ludwigsburg.
U.S.N.M. United States National Museum, Washington.
Z.M.B. Zoologisches Museum der Humboldt Universität, Berlin.
Z.M.H. Zoologisches Staatsinstitut und Zoologisches Museum, Hamburg.
Z.M.K. Zoologiske Museum, København (Copenhagen).
Z.S.B.S. Zoologisches Sammlung des Bayerischen Staates, München.

URACENTRON Kaup, 1826, Isis (von Oken), 19 : 88.

Type species *Lacerta azurea* Linnaeus.

Diagnosis. *Uracentron* belongs to that group of South American-West Indian iguanids that is distinguished by the presence of a large sternal fontanelle and the absence of femoral pores, the " tropidurines " (Etheridge, 1964 : 629). Within the tropidurines *Uracentron* is probably most closely allied to *Strobilurus*, *Tropidurus*, *Plica*, and *Platynotus*, all of which have a very large interparietal scale. *Uracentron* differs from these genera in having a short, spiny, nonautotomic tail that is about one half as long as the head and body ; in the others the tail is at least as long as the head and body, and is autotomic. Among South American iguanids only the unrelated *Hoplocercus* has a tail similar to *Uracentron*'s, but *Hoplocercus* may be easily distinguished by its small interparietal and heterogeneous dorsal squamation.

Characteristics. Upper head scales polygonal, juxtaposed, slightly to moderately convex, with a distinctly granular surface. Supraorbital semicircles poorly differentiated ; scales in frontal and prefrontal regions similar to other snout scales. Three or four pair of frontals, of which one to three may be in contact medially between the orbits, or separated by a median row of small scales. One to three rows of enlarged supraoculars, at least some of which are transversely expanded. Enlarged supraoculars usually separated from frontals and frontoparietals by two rows of small scales. Interparietal scale very large, one third to one fourth as wide as the head, narrower in front, usually longer than wide, with a central " eye ". Nasal large, dorsal, separated from rostral and upper labials by a row of scales ; opening large, directed dorsally in the posterior part of the scale. One or two large, convex, overlapping canthals. Canthals followed by six elongate superciliaries, each overlapping the one behind, followed by three shorter scales that overlap in the opposite direction. Two or three large scales in loreal region. A wide, elongate subocular scale with a keel along its upper margin, preceded by two or three shorter but similar scales that border the orbit anteriorly. A single row of rather large loreolabials, ending below the subocular, which posteriorly forms a short suture with the last upper labial. Upper labials large, more or less rectangular. Temporals polygonal, juxtaposed, smooth or keeled. Lower labials similar to upper labials but larger still. No enlarged postmental scales. Gulars small, mostly hexagonal, convex, juxtaposed or subimbricate, reduced in front of the anterior transverse gular fold, enlarged and imbricate in front of the posterior transverse gular fold. Tympanum about as large as the eye, without projecting scales along its anterior margin.

No scale row aligned mid-dorsally. Dorsal and lateral scales of neck and anterior body small, convex and juxtaposed, or keeled and imbricate. Remaining dorsal and lateral scales of body larger, imbricate, smooth or keeled. Ventral body scales imbricate, smooth or faintly keeled, larger than dorsals.

Tail short, not autotomic, about one half as long as the head and body, moderately or strongly depressed, with equal whorls of large, spinose scales.

Limbs covered with rhomboidal, imbricate scales, smooth or keeled, those on the posterior surface of the thighs reduced. Scales of palms and soles imbricate, denticulate, smooth or faintly keeled. Subdigital lamellae mostly tricarinate and tridenticulate, the keels becoming faint on the distal lamellae.

Two transverse gular folds present, the anterior one just posterior to a line even with the lower border of the tympanum, and with normal gular scales ; the posteror fold formed by ventromedial extensions of the antibrachial folds, and enclosing reduced but not granular scales. Antibrachial folds extend up and back over the forelimbs, then slant back and downward along the side of the body, fading out about midway to the hind limbs. Sides of neck with well developed, irregular folds. A ventrolateral longitudinal fold present between the forelimb and hind limb insertions.

Scales on top and sides of head and on chin with numerous, closely set scale organs. Body scales with a single scale organ or none at all. Caudal scales with several prominent scale organs along posterior edge on each side of keel. No femoral or preanal pores.

Uracentron azureum (Linnaeus)

Lacerta azurea Linnaeus, 1758, p. 202 (type locality, Africa; here restricted to the vicinity of Paramaribo, Surinam).
Stellio brevicaudata Latreille, 1802, p. 29 (type locality, interior of Guiana and Surinam).
Stellio azureus Latreille, 1802, p. 34.
Stellio brevicaudatus Daudin, 1802, p. 40.
Stellio azureus Daudin, 1802, p. 36.
Uromastyx caeruleus Merrem, 1820, p. 56 (substitute name for *Stellio azureus*).
Uromastyx azureus Merrem, 1820, p. 57.
Uracentron azureum Kaup, 1826, c. 88.
Uracentron coeruleus Kaup, 1826, c. 88.
Doryphorus brevicaudatus Cuvier, 1829, p. 34.
Doryphorus azureus Cuvier, 1829, p. 34.
Urocentron azurea Wagler, 1830, p. 45.
Ophessa (*Uranocentron*) *brevicaudatus* Gray, 1831, p. 42.
Ophessa (*Uranocentron*) *azureus* Gray, 1831, p. 42.
Urocentron brevicaudatum Wiegmann, 1834, p. 48.
Urocentron azureum Fitzinger, 1843, p. 77.
Urocentron azureum Boulenger, 1885, p. 182.

Syntypes. No. KaF 1900 : 113 (2 exs) in the Naturhistoriska Riksmuseet, Stockholm, Sweden.

Type locality. In listing Africa as the type locality of *Lacerta azurea*, Linnaeus (1758 : 202) probably was misled by Seba (1734 : 2 : 62 : 6), who had figured this

species and given Africa as its origin. Nevertheless, Linnaeus did have before him two specimens upon which his description was based, and there is reasonably good evidence that they had come from the neighbourhood of Paramaribo, Surinam.

Many of the species of South American plants and animals described by Linnaeus were collected by Carl Gustaf Dahlberg, a man of Swedish nationality, who arrived in Surinam in 1746, where he acquired plantations on Peruca Creek, and Cottica River, within 100 km of Paramaribo. In 1754, during one of his return trips to Sweden, Dahlberg presented his collections to King Adolf Fredrik and in the same year Linnaeus (1754 : 42) described specimens of *Lacerta azurea* in the museum of the King. When Dahlberg returned to Surinam in 1755 he took with him Daniel Rolander at the request of Linnaeus, who at least partly financed Rolander's trip. Rolander was a former student of Linnaeus, and private tutor to his son. Rolander is known to have collected in the neighbourhood of Paramaribo, and also went up the Commewijne River. The unrest caused by the revolt of escaped negro slaves prevented him from penetrating deeper into the interior of Surinam, and in 1756 he returned to Sweden. Part of Rolander's collection was purchased by the Swedish Baron de Greer, who in turn presented the specimens to Linnaeus (Holthuis, 1959 : 17–21).

Most of the South American species of lizards described by Linnaeus, including *Uracentron azureum*, are widely distributed in the northern part of the continent, and are known to occur at Paramaribo. It seems probable that many, if not all, of Linnaeus' specimens were from the collections of Dahlberg and Rolander, made in the vicinity of Paramaribo. I therefore propose the restriction of the type locality of *Uracentron azureum* to the vicinity of Paramaribo, Surinam.

Characteristics. The supraoculars are variable in shape ; one, two, or two and a half rows of enlarged scales may be present. The scales of the inner row are always to some extent transversely widened, but never strap-like. The enlarged supraoculars are always separated from the superciliaries by two rows of small scales.

The dorsal and lateral scales of the neck and anterior part of the body are very small, smooth, convex, and juxtaposed. Posteriorly the dorsal and lateral scales of the body become larger, imbricate, and obtusely keeled, largest in the sacrolumbar region. The ventral scales are smooth. Scale counts are given in Table I.

The tail is moderately depressed, with about 21 whorls of large, spinose scales. A whorl halfway between the vent and the tip of the tail contains about 13 scales. The tail is 0.48 to 0.65 (mean, 0.58) times as long as the head and body.

The snout-vent length of the largest male examined is 87 mm, of the largest female 86 mm.

Colour in preservative : the upper surfaces are bluish-grey, with bold, black markings. The medial half of the supraocular region is black, and there is usually a median, V-shaped mark in front of the frontal region. A W-shaped mark on the back of the head has its median apex on the interparietal scale, and its horns extend down to the suboculars. Two crescentric bands cross the neck, the extremities of the anterior one curving down through the tympani to the angle of the mouth.

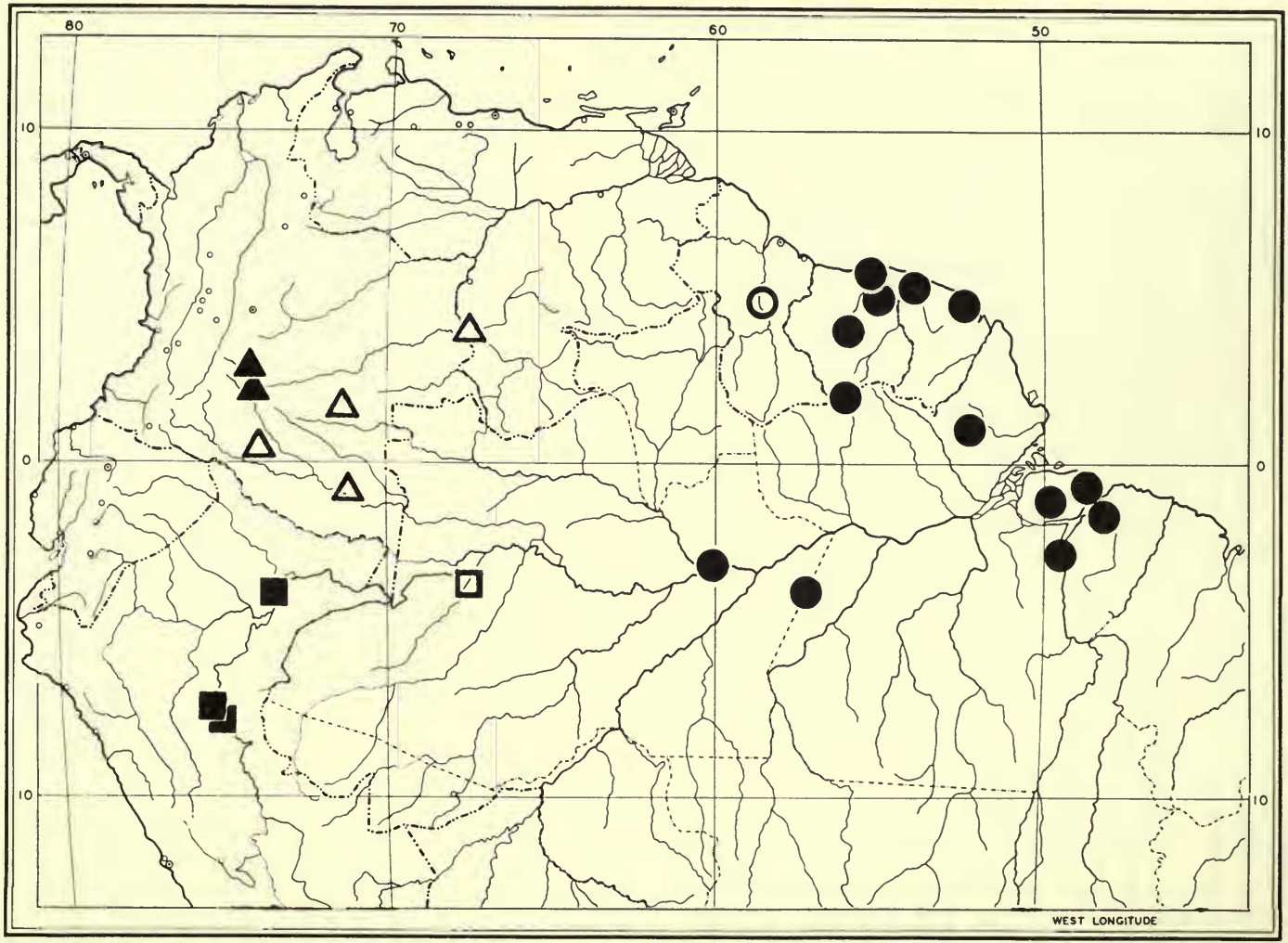

FIG. 1. Map of northern South America showing localities for *Uracentron azureum* (circles), *U. guentheri* (squares), and *U. werneri* (triangles). Inexact localities are indicated by open symbols.

A series of similar crescentric bands cross the back, the extremities of the first curving down into the antihumeral folds. Five or six bands may be present between the shoulders and the sacrum, or the posterior one, two, or three bands may be broken and off-set at the dorsal midline, or may be broken up into a bold reticulum. A black reticulum covers the upper surfaces of the limbs, and is most intense on the hind limbs. The tail has irregular black marks above, and about one half of the spines along the sides of the tail are tipped with yellow. Below, the throat is dark bluish-grey. The belly is a lighter grey, and the ventral surface of the tail is dark bluish-grey along the sides, with a yellowish area down the middle.

Mr. Marinus S. Hoogmoed has furnished me with colour notes on a living individual captured along Feticreek, Litani River, in Surinam. The colour is described as " head and back yellow-green mottled, tail with yellow points, throat yellow-green ; belly, underside of legs grey-blue ". Cott (1926) has published an excellent coloured illustration of this species.

RANGE. (Text-fig. 1). Records of *Uracentron azureum* are from British Guiana, French Guiana, and Surinam, and from along, or near the Amazon River in north-eastern Brazil, as far west as Manaus. *U. azureum* and *U. flaviceps* occur together at Manaus.

MATERIAL EXAMINED. *British Guiana* : no specific locality B.M.N.H. 1905.10.21.1. *Surinam* : Bergenaal N.M.W. 13926 (2 exs) ; no specific locality. M.H.N.P. 2515, Z.S.B.S. 534/0, M.C.Z. 4500. *French Guiana* : Cayenne M.H.N.P. 196, 2514, 2396 ; Saint Laurent M.H.N.P. 24.121 ; Mornes du bas Mahurg M.H.N.P. 03.20 ; no specific locality M.H.N.P. 8211, 2516, B.M.N.H. 1920.1.20.1334, Z.S.B.S. 534/0. *Brazil* : Amazonas, Manuas B.M.N.H. 1922.6.15.1, C.A.S. 84247 ; Amazonas, Manjuru River A.M.N.H. 101945 ; Pará, Ilha Marajó, Soute S.M.F. 24930 ; Pará, Ilha Marajó, Dist. Calderão Z.S.B.S. 37/1924 (5 exs), Z.M.H. 4421 (5 exs), 4496 ; Pará, Ilha Marajó B.M.N.H. 1923.11.9.68–72, 1926.5.5.5, S.M.F. 24931 ; Pará, within 50 miles of Belem M.C.Z. 53216 ; Pará, Amnuathena, Rio Tocantíns Z.S.B.S. 674/1920 ; Amapá, Serra do Navio S.M.F. 59580 ; Maranhão S.M.F. 11202 ; no specific locality M.H.N.P. 92.290, 99.215, N.M.W. 13928.1, B.M.N.H. 51.7.17.45, A.M.N.H. 58277–9, 60330–2. South America : no specific locality B.M.N.H. 47.2.19.6, 59.12.28.2, 66.8.14.302, N.M.W. 13927 (2 exs), N.R.M.S. Kaf 1900 : 113 (syntypes), S.M.N.L. unnumbered.

Additional records from Surinam have been provided to me (*in litt.*)by Mr. Marinus S. Hoogmoed : Litani Fetikreek, Sipaliwini, Paloemeu, Berg en Dal, and Moengo.

Uracentron guentheri Boulenger

Urocentrum guentheri Boulenger, 1894, p. 729 (type locality : Iquitos, Peru).
Urocentron guentheri Burt and Burt, 1933, p. 49.

HOLOTYPE. No. 93.7.10.13 (RR 1946.8.29.85) in the British Museum (Natural History), London. Collector, A. E. Pratt.

CHARACTERISTICS. Four or five transversely widened, band-like supraocular scales are present in a single row, all in contact laterally with the superciliaries, or

the first two or three may be separated from the superciliaries by a row of very small scales.

The dorsal and lateral scales of the neck and anterior part of the body are very small, smooth, convex, and juxtaposed. Posteriorly the dorsal and lateral scales of the body become larger, imbricate, and weakly, obtusely keeled, largest in the sacrolumbar region. The ventral scales are smooth. Scale counts are given in Table I.

The tail is moderately depressed, with about 21 whorls of large, spinose scales. A whorl halfway between the vent and the tip of the tail contains about 13 scales. The tail is 0.52 to 0.57 (mean 0.54) times as long as the head and body.

The snout-vent length of the largest male examined is 75 mm., of the largest female 75 mm.

Colour in preservative : the upper surfaces are bluish-grey with black markings. Many of the head scale sutures are edged in black, and the supraocular region on each side is outlined in black, with a black bar across the middle. On the frontals is a median, longitudinal black bar. Five or six narrow, somewhat irregular, crescentric bands cross the posterior part of the head and neck, with the horns of each crescent pointing downward and forward. Across the shoulders is a similar, narrow crescent that descends on each side into the antihumeral folds. The upper surface of the limbs and most of the back are covered by a bold reticulum of black lines. In the middle of the anterior part of the back the reticulum tends to form short, transverse bars. On the hind leg the reticulum extends onto the posterior surface of the thigh. The caudal scales and the ends of their spines are outlined in yellow. The ventral surface of the head and body is light bluish-grey, becoming yellowish in the preanal area and under the tail. There are no records of the colour in life of this species, but is seems probable that the bluish-grey background of preserved animals is green in life. A black-and-white illustration of the pattern may be found in Boulenger, 1894 : pl. 47, fig. 3.

Range. (Text-fig. 1). Records of *Uracentron guentheri* are from the Río Ucayali system in the Department of Loreto in eastern Peru, and from the western Amazonian basin in northwestern Brazil. The range of *U. guentheri* apparently overlaps that of *U. flaviceps* in eastern Peru and Brazil, and the two are definitely known to occur together at Iquitos, Peru.

Remarks. Boulenger (1894 : pl. 47, fig. 3) shows the tip of the tail of the holotype of *Uracentron guentheri* blunt. Mertens (1925 : 76) used this as a character to distinguish it from *U. werneri*. However, the blunt tail of the holotype of *U. guentheri* is due to injury; the tip is missing and the end of the tail is healed over with scar tissue. The tail has 16½ rows of spinose scales ; about 5½ rows are missing.

Material examined. *Peru* : Dept. Loreto, lower Río Cushdbatay A.M.N.H. 56410 ; Dept. Loreto, Roaboya, Río Ucayali A.M.N.H. 57204 ; Dept. Loreto, Rian Rian, Contamana region, Río Sahnaya Valley A.M.N.H. 57205 ; Dept. Loreto, Iquitos B.M.N.H. 93.7.10.3 (RR 1946.8.29.85) (Holotype). *Brazil* : Amazonas, Río Jutai Z.M.B. 30974 ; Amazonas, Río Solimoes, Lago Calado S.M.F. 30304/5.2.

Uracentron werneri Mertens

Uracentron werneri Mertens, 1925, p. 75 (type locality : upper Orinoco, Venezuela).

HOLOTYPE. No. 11203 in the Natur-Museums und Forschungs-Institutes, Frankfurt am Main. Collector, G. Hübner.

CHARACTERISTICS. The shape and size of the supraoculars are variable ; two or two and a half rows of enlarged scales with four or five scales in each, those of the inner row somewhat transversely widened, and those of the outer row separated from the superciliaries by two rows of small scales.

The dorsal and lateral scales of the neck and anterior part of the body are very small, smooth, convex, and juxtaposed. Posteriorly the dorsal and lateral scales of the body become larger, imbricate, and remain smooth. The ventral scales are smooth. Scale counts are given in Table I.

The tail is moderately depressed, with about 21 whorls of large, spinose scales. A whorl halfway between the vent and the tip of the tail contains about 13 scales. The tail is 0·56 to 0·60 (mean, 0·57) times as long as the head and body.

The largest male examined is 60 mm. snout-vent length, the largest female is 58 mm.

Colour in preservative : all upper surfaces are dark greyish-brown or bluish-black, somewhat lighter on the snout and sides of the head. A pattern of light spots and a dark nuchal collar is very faintly indicated in some specimens, including the holotype. The holotype has a bold, yellowish, asymetrical spot on the top of the head that covers the interparietal and adjacent scales on both sides and to the rear, and extends forward on the right side only, narrowing towards the superciliary ridge. This mark appears to be anomalous, for it is absent in all specimens other than the holotype. According to Valdivieso and Tamsitt (1963:31) living animals of this species are bright green.

RANGE. (Text-fig. 1). Records of *Uracentron werneri* are from the upper Río Orinoco valley in Venezuela, and from near the western tributaries of the Orinoco in Colombia.

MATERIAL EXAMINED. *Venezuela* : Amazonas, Alto Orinoco S.M.F. 11203 (holotype). *Colombia* : Metá, near Macarena, Río Guayabero A.M.N.H. 91755 ; Vaupes, Cerro Yapopoda M.C.Z. 67982. Published records from Colombia are Caquetá (Dunn, 1944 : 89), and near the Macarena Mountains, Metá (Valdivieso and Tamsitt, 1963 : 31).

Uracentron flaviceps (Guichenot)

Doryphorus Azureus, variety Duméril, 1851, p. 85.
Doryphorus flaviceps Guichenot, 1855, p. 26 (type locality : Sarayacu, Peru).
Doryphorus castor Cope, 1870, p. 556 (type locality : Pebas, " Ecuador ", now Peru).
Uranocentron flaviceps O'Shaughnessy, 1881, p. 245.
Urocentron flaviceps Boulenger, 1885, p. 183.
Urocentron castor Boulenger, 1885, p. 184.

HOLOTYPE. No. 6682 in the Muséum National d'Histoire Naturelle, Paris. Collectors, Castelnau and DeVille.

CHARACTERISTICS. The supraocular scales are variable ; usually there is an inner

row of four or five transversely widened scales, and an outer row of three or four scales that are about half as large as those of the inner row, with a single row of scales between the outer row and the superciliaries.

The dorsal nuchal scales are somewhat conical and keeled, with tiny granules in between. These grade laterally into smaller, but otherwise similar scales on the sides of the neck. The dorsal body scales are larger, imbricate, and distinctly keeled, largest in the sacrolumbar region. The lateral body scales are a little smaller, but otherwise similar to the dorsals. The ventrals are smooth, or faintly keeled, especially in the pectoral region. Scale counts are given in Table I.

The tail is very flat and wide, almost leaf-like, with 30 to 38 whorls of moderately large, spinose scales. A whorl halfway between the vent and the tip of the tail contains 9 to 11 scales. The tail is 0·48 to 0·63 (mean 0·50) times as long as the head and body.

The largest male examined is 128 mm. snout-vent length, the largest female is 87 mm.

Colour in preservative : juveniles and females are a rich, dark brown above, with numerous small, light spots; the spots are light bluish on the head, forelimbs, and anterior part of the body, becoming yellowish on the posterior part of the body, hind limbs, and tail. In juvenile males the light spots tend to be absent from a crescentric band across the nape, leaving a solid, dark band. The throat in females and juvenile males is light bluish with brown spots that may be arranged in irregular, oblique rows ; other ventral surfaces are light grey. In adult males the light bluish spots of the head and neck increase in extent, and join one another until the head and neck have small brown spots on a bluish background. The dark brown nuchal band becomes conspicuous, and is bordered behind by a light, bluish band. On the remainder of the body, limbs, and tail the light spots become obscure or disappear entirely, leaving a uniform dark brown surface. The ventral surfaces become brown as well, except for the chin and throat, and the ventral surface of the tail where some yellow spotting usually remains.

According to my field notes of 7th August, 1961, an adult male of 88 mm. snout-vent length, obtained 39 km. NNE of Oxapampa, Dept. Pasco, Peru (now L.A.C.M. No. 39161) had the following colour in life : dorsum of body, limbs, and tail very dark brown, finely punctate with yellow on limbs and sides of body ; head reddish-brown mottled ; collar a wide, dark brown band bordered behind by a yellow band ; chest and venter of limbs iridescent blue-green ; tail reddish below ; throat dirty yellow. Another male, 114 mm. snout-vent length, from the same locality, had the same pattern, but with colours more intense, and the head was bright reddish. After six years in preservative the reddish and yellow colours have become light bluish-green. Guichenot (1855, pl. 3, fig. 2) gives a coloured illustration of the holotype.

Range. (Text-fig. 2). Records of *Uracentron flaviceps* are from the western part of the Amazonian Basin in northwestern Brazil, southeastern Colombia, eastern Ecuador, and eastern Peru. The species occurs together with *U. guentheri* in Peru, and with *U. azureum* in Brazil.

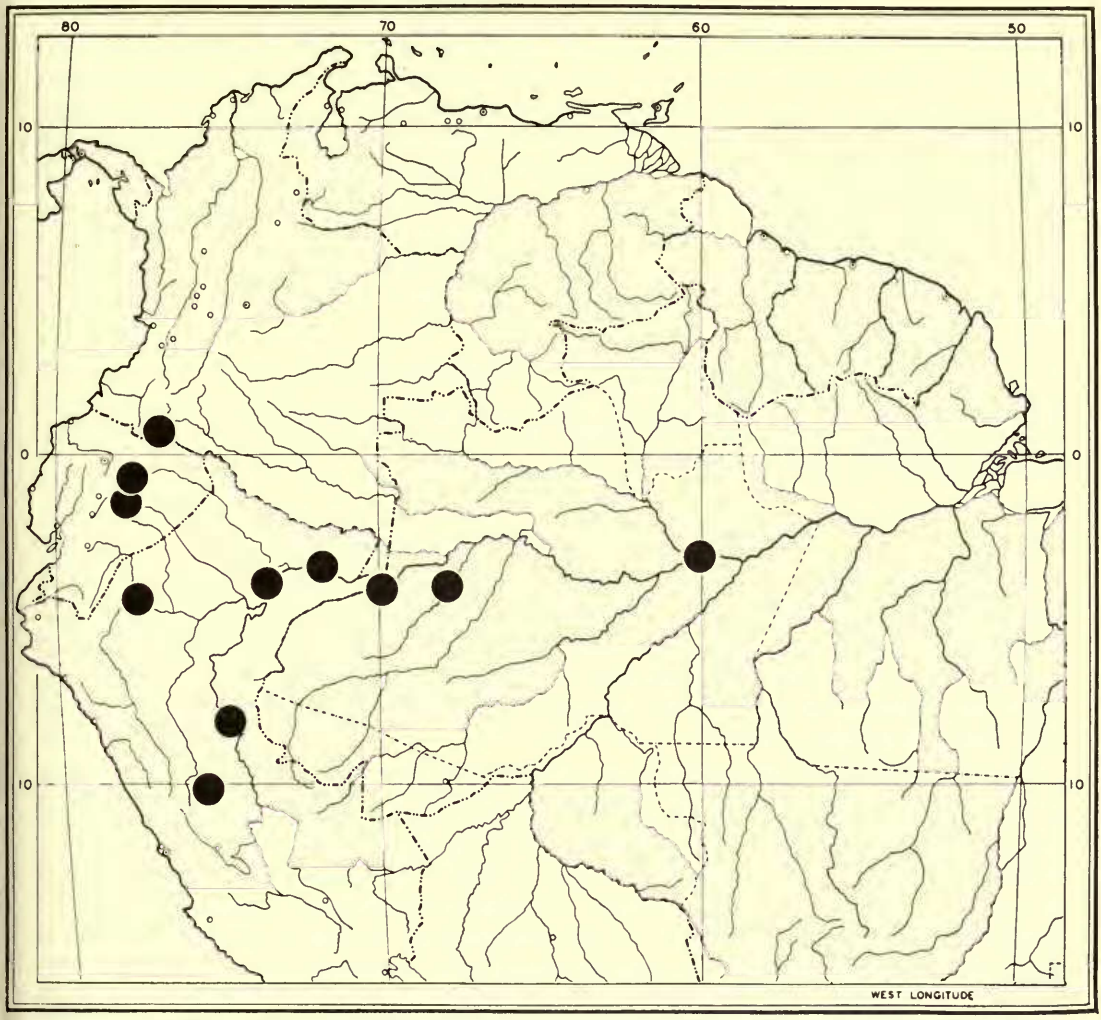

FIG. 2. Map of northern South America showing localities for *Uracentron flaviceps*.

REMARKS. In his description of *Doryphorus castor*, Cope (1870 : 55) used as the principle diagnostic character the presence of the nostril between two scales rather than within a single scale. Boulenger (1885 : 184) recognized *U. castor* as a valid species, but called attention to its close similarity with *U. flaviceps*. Mr. E. V. Malnate has examined the holotype of *U. castor* (A.N.S.P. 11303), and compared it with specimens of *U. flaviceps* from eastern Peru. He has informed me (*in litt.*) that contrary to Cope's description each nasal opening is within a single scale, and in this and in all other details of scalation and colour pattern the specimen is indistinguishable from *U. flaviceps*.

In his list of the type specimens of lizards in the Paris Museum, Guibé (1954 : 42) incorrectly considered *Uracentron flaviceps* to be a synonym of *U. azureum*.

MATERIAL EXAMINED. *Colombia* : Amazonas, Leticia F.M.N.H. 83038, 78384–5 (2 exs) ; Putumayo, Santa Rosa de los Kofanes, upper Río Guamues F.M.N.H. 165828. *Ecuador* : Sarayacu M.H.N.P. 6882 (holotype), B.M.N.H. 80.12.8.56 ; Canelos B.M.N.H. 80.12.8.57–9 ; Pastaza River M.C.Z. 37270 ; Napo, Santa Cecilia M.C.Z. 92519 ; no specific locality Z.M.B. 9988. *Brazil* : Amazonas, Río Madiera A.M.N.H. 57207 ; Amazonas, Manaus N.H.M.P. 92.291 ; Amazonas, Rio Jutaí Z.M.B. 30973 ; Amazonas, Rio Solimoẽs N.R.M.S. 3342 ; Amazonas, Lago Calado S.M.F. 30304/5.1. *Peru* : Loreto, Iquitos A.M.N.H. 56408, N.M.W. 13929 (2 exs), 13930, F.M.N.H. 45487 ; Loreto, Prov. Ucayali, Yarinacocha F.M.N.H. 45484, 56064 ; Loreto, Prov. Ucayali, Pucalpa F.M.N.H. 56061–3 ; Loreto, Prov. Bajo Amazonas, Quidtococha F.M.N.H. 45485–6 ; Loreto, upper Ucayali A.M.N.H. 71101–2 ; Loreto, Pebas A.N.S.P. 11303 (holotype *Doryphorus castor*) ; Pasco, 39 km NNE of Oxapampa L.A.C.M. 39161 ; Loreto, Pongo Manseriche, Marañon valley A.M.N.H. 56409 ; between Apaga and Nieva A.M.N.H. 57206. No specific locality B.M.N.H. 69.5.21.57.

Species Referred Erroneously to *Uracentron*

Urocentrum meyeri was described by Werner (1900 : 4) from Lima, Peru, and included by Burt & Burt (1933 : 49) in their list of South American lizards. The holotype and only specimen was destroyed in the Dresden Museum (No. 1764) during the last days of World War II. However, the description contains details that are sufficient to identify the specimen as belonging to the genus *Stenocercus* rather than *Uracentron*.

The upper head scales are smooth, the interparietal scale small, and there is a projecting auricular scale. The tail is flattened, but scarcely wider than the sacral region, with spiny scales in rings, and is a little longer than the head and body length : total length 131 mm., tail length 77 mm. These are all characteristics of the spiny-tailed species of *Stenocercus: atrigularis, roseiventris, marmoratus, crassicaudatus, carrioni*, and *simonsi*. Additional details in the description, and the type locality indicate that the specimen may have been one of *Stenocercus crassicaudatus*. The sides of the neck have two converging folds, a postympanic and an antihumeral fold, with a horizontal fold between them ; the dorsal scales are small and granular. A median dorsal crest is not mentioned, and presumably was lacking. The ventral scales are said to be similar to the dorsals, but faintly keeled, almost smooth. Only the faintly keeled ventrals are not characteristic of *S. crassicaudatus*. Although there are no records of *S. crassicaudatus* from Lima, the species does occur inland from Lima at higher elevations. The exact identity of Werner's species may never be known, but in any event it is clearly not referrable to *Uracentron*.

Burt & Burt (1933 : 49) also included in their checklist of South American lizards the name *Urocentron palluma*, which they credited to Tschudi (1846 : 35). However, it is clear from Tschudi's own treatment in his *Fauna Peruana* (incorrectly cited by Burt & Burt as 1845), and in an earlier work (Tschudi, 1845 : 157–8) that he is referring to *Phymaturus palluma*, which Tschudi correctly attributes to Molina (1782 : 217). Tschudi listed *Phymaturus* Gravenhorst as a subgenus of *Urocentron*,

and gave as its only species in Peru " *U. palluma* Tschudi ". Although he followed the species with his own name, he listed *Lacerta palluma* Molina in its synonomy. Burt & Burt's error is clearly that of accepting Tschudi's placement of *Phymaturus palluma* in the genus *Urocentron*, and, apparently because Tschudi followed the species name with his own, considering Tschudi to be its author. *Phymaturus* is a valid, monotypic genus, containing only the species *palluma*, and quite unrelated to *Uracentron*. It differs from the latter in many ways, including the presence of tricuspid premaxillary teeth, preanal pores in males, a small interparietal scale, and a rather slender, somewhat spiny, autotomic tail.

Relationships Within ***Uracentron***

Uracentron flaviceps stands apart from the other three forms of *Uracentron* as the most distinctive species. Compared with the others its tail is much flatter and wider, with smaller, less distinctly spinose scales. Its body scales are larger and consequently fewer in number around the middle of the body, and more distinctly keeled. *U. flaviceps* also attains a greater maximum size.

Uracentron azureum, *U. guentheri*, and *U. werneri* are very similar in the form of their body and tail, and in scalation. *U. guentheri* differs from *azureum* and *werneri* in having greatly expanded, band-like supraoculars, and *U. werneri* differs from *azureum* and *guentheri* in having smooth dorsal scales in the sacrolumbar region. The most obvious differences among the three are their colour patterns : bold black cross-bands usually followed by a bold reticulum in *azureum*, a finer reticulum with narrow cross-bands on the neck in *guentheri*, and solid or faintly spotted in *werneri*. The most extreme example of breaking up of the posterior cross-bands into a reticulum in *azureum* does not approach the pattern of *guentheri*, but transitional stages between the two are not difficult to imagine. The pattern of *werneri* might result from an overall darkening of the pattern of *guentheri*.

The ranges of *U. azureum*, *U. guentheri*, and *U. werneri* are not known to contact one another, or to overlap. With the acquisition of more specimens from intermediate areas it may become possible to determine whether or not any two, or all three of these species intergrade. Until that time the best course would seem to be recognition of three separate species.

1 Tail very strongly depressed. More than 25 whorls of caudal scales from base to tip of tail. Dorsal body scales, including nuchals, distinctly keeled . . ***flaviceps***
– Tail moderately depressed. Not more than 25 whorls of caudal scales from base to tip of tail. Dorsal scales of neck and anterior part of body smooth . . . 2
2 Four or five band-like supraoculars separated from superciliaries by one row of small scales, or in contact with superciliaries . . . . . ***guentheri***
– Supraoculars variable, but those enlarged separated from superciliaries by at least two rows of small scales 3
3 Dorsal body scales in sacrolumbar region obtusely keeled. A bold dorsal pattern of black cross-banks or anterior cross-bands and posterior reticulum . . ***azureum***
– Dorsal body scales of sacrolumbar region smooth. Dorsum solid gray-brown, or faintly spotted . . . . . ***werneri***

STROBILURUS Wiegmann, 1834, Herp. Mex., p. 18

Type species *Strobilurus torquatus* Wiegmann.

Diagnosis. *Strobilurus* is a member of the tropidurine group of South American–West Indian iguanid lizards. It was not initially included in that group because I had no data on the structure of the skeleton (Etheridge, 1964 : 629). I have since determined, however, that a large sternal fontanelle is present, and on the basis of this and other osteological and integumentary characteristics, *Strobilurus* is clearly a member of the tropidurine group. Within the tropidurines *Strobilurus* is probably most closely allied to *Uracentron*, *Tropidurus*, *Plica*, and *Platynotus*, all of which have a very large interparietal sacle. The tail of *Strobilurus* is autotomic, about as long as the head and body, and provided with unequal whorls of spinose scales. In *Uracentron* the tail is about half as long as the head and body, and is not autotomic. In the other genera the tail is considerably longer than the head and body, and autotomic. Some species of *Tropidurus* have a moderately spiny tail due to sharp, projecting mucrons, but the spines are not nearly as well developed as they are in *Strobilurus*. Among other South American iguanids some species of *Stenocercus* also possess a tail about equal to the head and body length, and provided with unequal whorls of stout, spinose scales. However, the interparietal scale of *Stenocercus* is very small, or absent entirely.

Characteristics. Upper head scales polygonal, juxtaposed, with a distinctly granular surface. Supraorbital semicircles not well differentiated as such. Three pairs of frontals in contact between the orbits, preceded by two or three larger prefrontals and frontonasals on each side. Two rows of enlarged supraoculars, four or five scales in each row. Those on the inner row a little wider than long and separated from the supraorbital semicircles by two rows of smaller scales ; those on the outer row separated from the superciliaries by two rows anteriorly and one row posteriorly. Interparietal scale very large, about one third as wide as the head, narrowing anteriorly, and as wide as to a little wider than long. A median " eye " present anteriorly in the interparietal scale, and often a median pit followed by a median groove posteriorly. Nasal scale large, dorsolateral in position, with a small, dorsally directed nostril in the posterior part of the scale. Nasal separated from rostral and upper labials by a single row of scales. Two rather small but strongly convex canthals. Canthals followed by five or six elongate, curved superciliaries, each of which overlaps the one behind, these in turn followed by three shorter superciliaries that overlap in the opposite direction. Several polygonal scales in the postnasal-loreal-preocular region. An elongate subocular narrowing anteriorly, with a keel along its upper margin. Loreolabials in a single row below the nasals, two rows below the loreal region, and one row between the subocular and upper labials. Temporals imbricate, obtusely keeled. Tympanum large, about equal to eye opening, with two flat, projecting scales in front. Upper labials more or less rectangular. Lower labials about one and a half times wider than upper labials. No enlarged postmentals. Gulars smooth, imbricate, reduced in size medially and posteriorly.

A row of scales aligned mid-dorsally from occiput to base of tail, its scales slightly

larger than, but otherwise similar to adjacent scales, forming a low denticulation in individuals over 100 mm. snout-vent length. Dorsal nuchals rhomboidal, imbricate, sharply keeled, the keels rising to sharp mucrons. Lateral nuchals smaller, spinose along the lateral nuchal folds. Dorsal scales of body rhomboidal, keeled, imbricate, shortly mucronate, the keels forming oblique lines that converge posteriorly toward the dorsal midline. Lateral body scales slightly smaller, but otherwise similar to the dorsals. Ventral scales smooth, imbricate, about one and a half times as large as the dorsals.

Tail about as long as the head and body, and autotomic. Base of tail slightly depressed and a little wider than the sacral region, with eight equal whorls of large, sharply keeled, and strongly spinose scales. Remainder of tail cylindrical and much narrower than the base, with scales of unequal whorls that correspond to the autotomy segments of the vertebral column. Anteriorly each segment with a ventrally incomplete anterior ring of small, smooth scales, and posteriorly an additional ventrally incomplete ring of small scales added to the anterior border of each segment.

Dorsal scales of forelimb rhomboidal, keeled, imbricate, about as large as dorsal body scales. Ventral scales of forelimb smaller, smooth, imbricate. Dorsal scales of hind limb sharply keeled and spinose, similar to but much smaller than spinose scales of tail. Postfemoral scales reduced, keeled, imbricate. Scales of palms and soles sharply keeled and mucronate, some of them tricarinate and tridenticulate. Subdigital lamellae tricarinate and tridenticulate.

A transverse fold extends across the throat just posterior to a line even with the tympani, but scales within fold not differentiated from adjacent gulars. A pair of short, deep, antihumeral folds enclosing very small scales, widely separated ventrally by about 12 anterior pectoral scales. A dorsolateral fold extends posteriorly from upper border of tympanum about halfway back to shoulder ; a ventrolateral fold begins as a pair of converging folds that meet just posterior to tympanum, and extend back to intercept antihumeral fold.

Scales on top and sides of head with numerous scale organs. Dorsal scales of body and limbs with one to three scale organs on the free edge, or none at all. Caudal scales with three to eight scale organs on each side of the keel, along the free edge. No femoral pores or preanal pores.

Strobilurus torquatus Wiegmann

Strobilurus torquatus Wiegmann, 1834, p. 18 (type locality, Brazil).
Steironotus (*Strobilurus*) *torquatus* Fitzinger, 1843, p. 71.
Doryphorus spinosus Guichenot, 1855, p. 27 (type locality, Bahía, Brazil).
Strobilurus torquatus Boulenger, 1885, p. 181.

Syntypes. Nos. 672–3 and 9215 in the Zoologisches Museum der Humboldt Universität, Berlin.

Characteristics. Since *Strobilurus* is a monotypic genus the characteristics of *torquatus* are the same as those of the genus. The vertebral scales counted from the

occiput to a line even with the anterior surface of the thighs when the limbs are extended at right angles to the body number 39 to 57 (mean, 55·6); the paravertebral scales counted in the same way are 49–72 (mean, 67·6). There are 19 to 29 (mean, 24·1) lamellae under the fourth finger, and 23 to 34 (mean 28·3) under the fourth toe. The tail is 0·93 to 0·95 (mean, 0·94) times as long as the snout-vent length. The largest male examined is 97 mm. snout-vent length, the largest female is 106 mm.

Colour in preservative : the head and neck above are bluish-grey, with bold, black markings. There is a narrow, black crescent on each side where the supraoculars contact the frontals and frontoparietals. A wide crescent extends across the anterior part of the neck from ear to ear, and from this crescent there extends anteriorly a medial bar. On each side a black crescent extends from the interparietal scale down to the angle of the mouth. A wide, black, crescentric collar about six or seven scales wide middorsally, extends down on each side into the antihumeral fold. Behind the black collar the dorsal surface of the body, limbs, and tail is somewhat darker greyish-green, with obscure lighter cross-bands. The chin and throat are marbled light and dark grey, and the belly is light grey. A coloured illustration may be found in Guichenot (1855, pl. 7, fig. 1a), labelled *Doryphorus spinosus*.

Range. *Strobilurus torquatus* is known from the states of Pernambuco, Alagoas, and Bahía, Brazil.

Remarks. Wiegmann described *Strobilurus torquatus* in a footnote (1834 : 18) and the subsequent taxonomic history of the genus and species has been relatively uncomplicated. The species has remained rare in collections.

Material examined. *Brazil* : Alagoas, São Miguel M.C.Z. 59275; Bahía, no specific locality Z.M.B. 9215, 672–3 (syntypes), 8272, M.H.N.P. 5085 (2 exs, syntypes of *Doryphorus spinosus*), N.M.W. 13908 (2 exs), B.M.N.H. 62.11.23.50, 1903.10.16.23; Pernambuco, no specific locality B.M.N.H. 88.4.18.6. *South America* : no specific locality M.H.N.P. 6880, N.M.W. 13909 (2 exs), B.M.N.H. xxiii.104a.

Table I

	azureum N = 58	*guentheri* N = 6	*werneri* N = 3	*flaviceps* N = 29
Scales along middle of black	105–(118·1)–139	124–(130·8)–139	127–(123·3)–141	74–(80·0)–88
Scales around middle of body	92–(107·0)–120	98–(110·4)–128	98–(105·3)–110	66–(78·2)–88
Subdigital lamellae of fourth finger	25–(28·0)–32	24–(27·4)–30	31–(31·3)–32	25–(29·7)–33
Subdigital lamellae of fourth toe	27–(30·5)–36	27–(29·0)–36	31–(31·6)–34	26–(30·3)–34

Table I. Some scale counts of *Uracentron*. Scales along middle of back counted from occiput to line even with anterior margin of hind limb at right angles to body ; scales around middle of body counted halfway between limb insertions. Mean figures in parentheses. N = number of specimens examined.

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